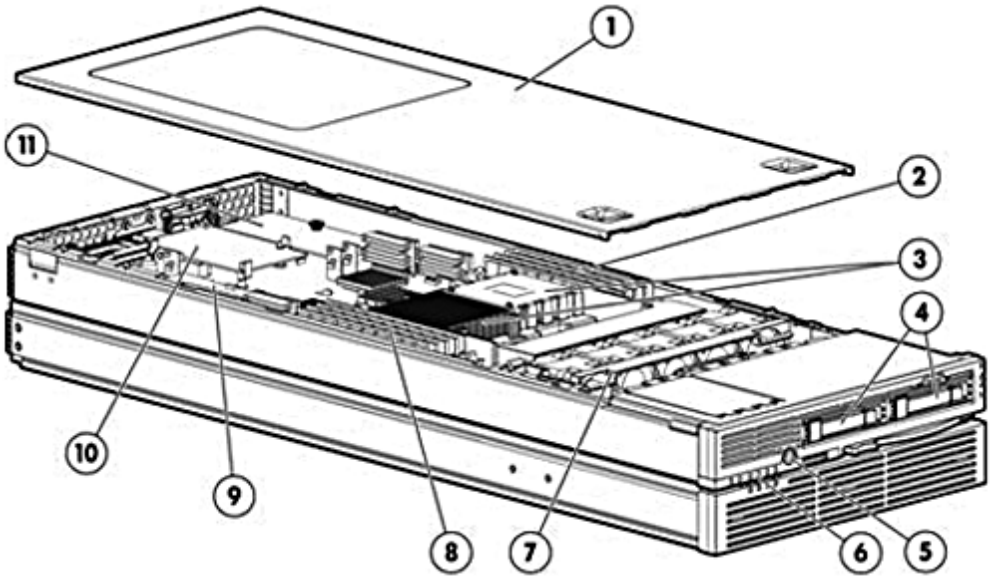
HP ProLiant BL45p Generation 2 (G2) Server Blade

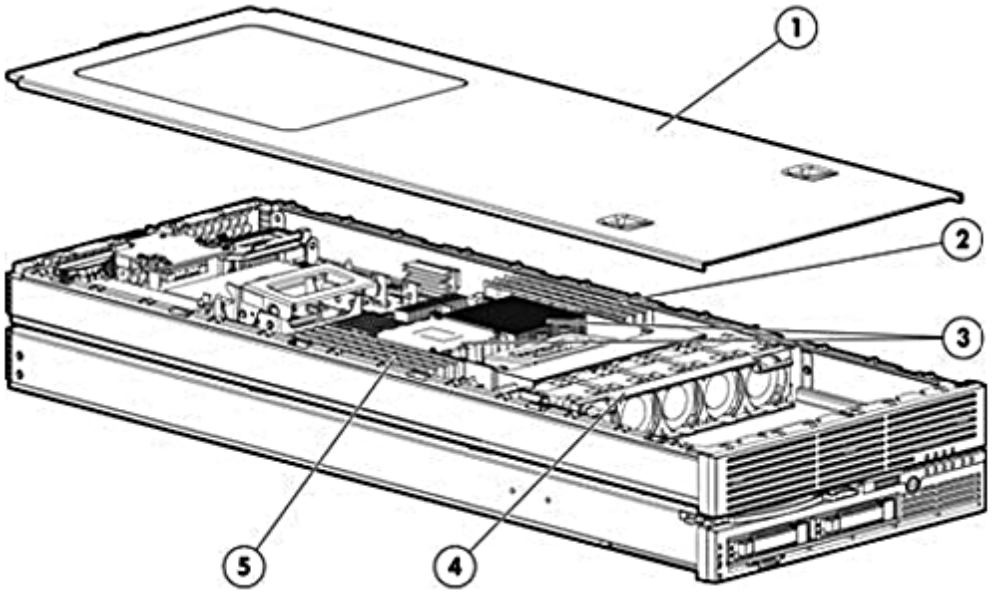
Primary Side – HP ProLiant BL45p G2 Server Blade



1. Primary Side Access Panel
2. Processor 3 Memory Banks E and F
3. Primary Side: Up to two AMD Opteron™ 8000 Series processors (shown with Processor 1 installed, two additional processors on Secondary Side)
4. Up to 2 small form factor (SFF) SAS or SATA hot-plug hard disk drives (optional)
5. Power On/Standby Button
6. Front panel LEDs
7. Redundant Fan Module
8. Processor 1 Memory Banks A and B
9. Smart Array E200i Controller cache module
10. Optional Dual Port Fibre Channel Adapter (QLogic-based or Emulex-based)
11. Optional NIC Adapter (single function or multifunction Gigabit)

Overview

Secondary Side – HP ProLiant BL45p G2 Server Blade



1. Secondary Side Access Panel
2. Processor 2 Memory Banks C and D
3. Up to two AMD Opteron™ 8000 Series processors (shown with Processor 2 installed, two additional processors on Primary Side)
4. Redundant Fan Module
5. Processor 4 Memory Banks G and H

   Other features on Secondary Side include an additional connector for an optional single or multifunction Gigabit NIC server adapter, and a connector for an optional Dual Port Fibre Channel adapter (QLogic-based or Emulex-based.)

What's New

- Support for 36 GB and 72 GB 15K DP Serial Attached SCSI (SAS) SFF Hot Plug Hard Drives
- Support for 72 GB and 146 GB10K DP Serial Attached SCSI (SAS) SFF Hot Plug Hard Drives

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At A Glance

This document covers the HP ProLiant BL45p G2 server blade only. For more information on HP BladeSystems p-Class Infrastructure and HP BladeSystem p-Class Interconnect Components, please see the following QuickSpecs:
HP BladeSystem p-Class Infrastructure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12330_na/12330_na.html and

HP BladeSystem p-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12331_na/12331_na.html

The HP ProLiant BL45p Generation 2 server blade delivers maximum quad-processor performance, enterprise manageability and availability, and superior expansion capabilities to the datacenter.

- Processor:
  - Up to four AMD Opteron™ 8000 series processors
  - Supports up to four AMD Opteron processors Model 8220 (2.8 GHz, 95W) featuring 1MB Level 2 cache memory per core
  - Processors are connected through 1 GHz HyperTransport™ links
  - ServerWorks HT-1000 and HT-2100 chipsets
- Memory:
  - Up to 64 GB of memory, PC2-5300 Registered DDR2 (667 MHz) memory, 16 DIMM slots
  - Advanced ECC memory support
  - Supports 2:1 memory interleaving
- Storage Controller:

Overview

- Integrated Smart Array E200i controller with 64 MB cache
- Supports RAID 0, 1
- Optional 128MB battery-backed write cache (BBWC) module for internal storage data protection

- Internal Drive Support:
  - Up to 2 small form factor (SFF) SAS or SATA hot-plug hard disk drives (support for SATA hard drives via Factory Integration only)
- Network Controller:
  - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows
  - One (1) embedded NC324i Dual Port Gigabit Network Adapter for HP BladeSystem
  - One (1) additional 10/100 NIC dedicated to iLO 2 management
- Optional Mezzanine Card support:
  - Supports (2) Fibre Channel Adapters
    - Dual-Port Fibre Channel Mezzanine (2-Gb) options for SAN connectivity (Choice of Emulex or QLogic)
  - Supports (2) networking cards for four (4) additional Ethernet network ports, choose from the following:
    - HP NC374m PCI Express Dual Port Multifunction Gigabit Server Adapter for HP BladeSystem with TCP/IP Offload Engine for Microsoft Windows
    - HP NC320m PCI Express Dual Port Gigabit Server Adapter for HP BladeSystem
- USB Ports:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
  - I/O cable with two (2) USB 2.0 ports, one (1) video port, one (1) iLO 2 port and one (1) kernel debug port. The cable was specifically designed to aid in initial server image deployment and ships with every HP BladeSystem p-Class server blade enclosure
- Redundancy:
  - The HP BL45p G2 server features ten (10) integrated fans for sufficient cooling. The redundant fan design allows for uninterrupted server operations
- Operating Systems:
  - Supports Windows, Linux, Solaris, and VMware ESX Server
- Form Factor:
  - The HP ProLiant BL45p G2 server blade plugs vertically into an HP BladeSystem p-Class server blade enclosure
  - HP BladeSystem p-Class server blade enclosures with enhanced backplane components might be required depending on which HP ProLiant server blade model is selected.
- Management:
  - Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (includes virtual KVM and graphical remote console at no additional cost)
- Enclosures:
  - The HP BladeSystem p-Class server blade enclosure is 6U (10.5-inches) in height, 19-inches wide and holds up to 4 HP ProLiant BL45p G2 server blades plugged vertically
- Warranty:
  - Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts, 3 Year Labor and 3 Year on-site limited global warranty. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA0-7987ENW.pdf

Processor NOTE: Support for two or four processor configurations only	AMD Opteron™ processor Model 8220 (2.8 GHz) AMD Opteron processor Model 8218 (2.6GHz) AMD Opteron processor Model 8216 (2.4GHz) AMD Opteron processor Model 8214 (2.2GHz) AMD Opteron processor Model 8212 (2.0GHz)* NOTE: AMD Opteron 8000 Series processors are 64-bit, dual-core, and support AMD Virtualization™ and DDR2 memory technology. AMD Opteron 8000 Series processors are connected through 1 GHz HyperTransport™ links. NOTE: *Offered via Factory Integration (North America) or Specials (EMEA and APJ) only.
Upgradeability	Upgradeable to quad processing (4 processors)
Cache Memory	1MB Level 2 cache memory per core
Chipset	ServerWorks HT-1000 and HT-2100
Memory	Type: PC2-5300 Registered DDR2 DIMMs (667 MHz) Standard: 4 GB (4 x 1 GB) Maximum: 64 GB (16 x 4 GB) NOTE: Memory must be installed in pairs. For additional memory configuration guidelines, see "Memory" section of this HP BL45p G2 QuickSpecs.
Network Controller	Two (2) embedded NC373i Multifunction Gigabit Network Adapters for HP BladeSystem One (1) embedded NC324i Dual Port Gigabit Network Adapter One (1) additional 10/100 NIC dedicated to iLO 2 Management NOTE: Must use a HP BladeSystem p-Class server blade enclosure with enhanced backplane components to utilize all four possible NIC's (HP P/N's 281404-B22, 243564-B22 or 380625-B22).
Expansion Slots	No PCI slots; all features are integrated. Additional network and fibre channel connectivity is available via optional mezzanine cards. I/O cable connectors: (2)USB 2.0 ports, (1) video port, (1) iLO 2 port and (1) kernel debug port (2) I/O cables ship with every HP BladeSystem p-Class server blade enclosure Tested USB devices (keyboard, mouse, floppy) are listed in the "Options" section of this QuickSpecs
Integrated Manageability	Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

Standard Features

Storage Controller	Smart Array E200i Controller	• 64MB memory module supports RAID 1, 0 • Supports SAS and SATA disk drives • Available upgrades: 128MB battery-backed write cache (BBWC) module

Maximum Internal Storage	Hot-plug Serial Attach SCSI (SAS)	292GB SAS	2 x 146GB Serial SCSI
	Hot-plug Serial ATA (SATA)	240GB SATA	2 x 120GB Serial ATA

Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)

Graphics Resolution Supported	Resolution Color Depths	Depths 1280 x 1024, 64k, 256, 16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16.7M, 64k, 256, 16 640 x 480, 16.7M, 64k, 256, 16

Fiber Channel on the HP ProLiant BL45p G2 server blade

The HP ProLiant BL45p G2 supports two (2) optional, dual port fiber channel adapters for SAN connectivity and redundancy. Customers are offered a choice of either QLogic-based or Emulex-based fiber channel adapters. Both adapters are mezzanine circuit boards which connect directly to the server blade system board. These fiber channel adapters are available via option kits and must be ordered separately.

- QLogic-based
  - Utilizes a QLogic ISP2312 chipset
  - The HP QLogic-based dual port Fibre Channel Adapter (P/N 361426-B21) is compatible with the HP ProLiant BL20p G3, BL20p G4, BL25p G2, and BL45p G2 server blades. It cannot be used with HP ProLiant BL25p G1, BL35p, or BL45p G1 server blades
  - Includes two small form factor pluggable transceivers with LC connectors for installation into the Patch Panel 2, CGESM or GbE2 Interconnect Switch (with the Storage Connectivity Kit)
- Emulex-based
  - Utilizes an Emulex "Thor" chipset
  - The HP Emulex-based dual port fibre channel HBA (P/N 394757-B21) is compatible with the HP ProLiant BL20p G3, BL20p G4, BL25p G2, and BL45p G2 server blades. It cannot be used with HP ProLiant BL25p G1, BL35p, or BL45p G1 server blades
  - There are no SFP's included in the Emulex mezzanine kit for use with ProLiant BL p-Class Fibre Channel pass-through interconnects. If you require SFPs for use with an Emulex mezzanine and a FC pass through interconnect please order an SFP option kit (P/N 397577-B21) which will provide 2 FC SFPs per option kit
- Two ports on each Dual-port Fibre Channel Mezzanine Card provide a redundant Fibre Channel connection to each server blade
- Supports up to 2 Gb/s Fibre Channel equipment

Compatible SAN

HP ProLiant BL45p G2 server blades are optimized for StorageWorks MSA, EVA, and XP arrays.

HP ProLiant BL45p G2 server blades are compatible with select 3rd party SANs (please see blade storage page for more details):
http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/storage.html

Standard Features

Insight Control Environment for BladeSystem

Starting July 9, 2007, HP Insight Control management suites and most HP ProLiant Essentials will include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. From more information about this service, please visit: http://www.hp.com/services/insight.

Insight Control Environment for BladeSystem delivers foundation management for HP BladeSystem lifecycles, including hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability, scanning and patch management.
Installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Select Pack
- HP Insight Power Manager
- HP ProLiant Essentials Rapid Deployment Pack
- HP ProLiant Essentials Performance Management Pack
- HP ProLiant Essentials Vulnerability and Patch Management Pack
- HP ProLiant Essentials Virtual Machine Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management DVD can be installed manually.

- Server Migration Pack
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

NOTE: Server Migration Pack - Physical to ProLiant Edition can be installed from the SMP-P2P CD included in the Insight Control Management media kit.
NOTE: Insight Control Environment for HP BladeSystem can be installed from the Insight Control Management DVD, which can be delivered with HP BladeSystem c-Class enclosures with a choice of licensing options. Licensing options include a free 30 day evaluation license for 8 servers (default option for every enclosure order), a full purchased license for 8 blade servers or a full purchased license for 16 blade servers). For additional information on HP c-Class Infrastructure please visit: HP BladeSystem c-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html
NOTE: For additional product and licensing information about Insight Control Environment for BladeSystem, HP Systems Insight Manager and Essentials software refer to http://www.hp.com/servers/proliantessentials.

Standard Features

ProLiant Essentials Foundation Pack Software for the ProLiant BL Server	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible environment to centrally manage servers, storage and other infrastructure devices across multiple operating system platforms.
	ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the Altiris Deployment Solution and ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP CD includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and is available for purchase with blade servers. For more information, visit http://www.hp.com/servers/rdp.
	ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources
	Virtual Machine Management Pack	Virtual Machine Management Pack - provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console
	Vulnerability and Patch Management Pack	Vulnerability and Patch Management Pack (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats.
	Insight Management Agents	Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers,
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq, support software, and configuration utilities	The latest drivers and firmware fully optimized and tested for your ProLiant server and options, available on the RDP Media kit, SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/go/support.

Standard Features

Optional ProLiant Essentials Value Packs

Starting July 9, 2007, HP Insight Control management suites and most HP ProLiant Essentials will include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. From more information about this service, please visit: http://www.hp.com/services/insight.

Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Server Migration Pack - The Server Migration Pack automates the manual processes required for migrating servers between physical or virtual platforms (P2V, V2P, and V2V).
- Server Migration Pack - P2P Edition - Upgrading or replacing your existing server? Effortlessly transition to new servers with automated, accurate and affordable migration of OS, application and data.
- Virtualization Management Software - Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. The Virtual Machine Management Pack plug-in provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association. The Server Migration Pack plug-in automates the manual task of migrating servers between physical or virtual platforms.
- Vulnerability and Patch Management Pack (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

Optional Remote Management and Management Suites

- Insight Control Environment for BladeSystem is based on HP Systems Insight Manager and ProLiant Essentials software, and brings the value of Insight Control to ProLiant customers by delivering comprehensive health and performance monitoring, remote control, vulnerability scanning and patch management as well as flexible deployment and power management through an integrated installation package and streamlined licensing. For more information, visit: http://www.hp.com/go/ice
- Integrated Lights-Out Select Pack - upgrades the iLO 2 processor with enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, power capping and enterprise security (directory services and two-factor authentication) for servers managed using remote consoles available in iLO 2 Standard and iLO 2 Standard Blade Edition.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.
NOTE: Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at http://www.hp.com/services/insight

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Standard Features

SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart can now deploy the ProLiant BL45p G2 server blades using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server, redeem the coupon that is included with your Blade server or order your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart.

SmartStart version supported (minimum): SmartStart 7.60

OS Support

Windows Server 2003, Web edition
Windows Server 2003, Server/Standard edition (32 & 64 bit editions)
Windows Server 2003, Enterprise edition (32 & 64 bit editions)
Red Hat Enterprise Linux
SUSE Linux Enterprise Server
Solaris 10 (32 & 64 bit editions)
VMware ESX Server 3

NOTE: For a complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.
NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant BL p-Class, please see: http://h18004.www1.hp.com/support/files/server/us/family/model/5342.html.
NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at: http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html.
NOTE: For more Linux OS support & certification information, please visit our the ProLiant & Bladesystem Server Linux matrix http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html

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Supported Software Options

VMware Virtualization Software

NOTE: For more information on HP's Certified and Supported HP ProLiant Servers, please visit the VMware Server Support Matrix at:
http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html

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Integrated Manageability

Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

- Virtual KVM based remote console
- Virtual Media (single server, browser based access only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console
- Dedicated network connectivity
- Embedded system health
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard RC4, 128-bit Secure Sockets Layer (SSL) and Secure Shell (SSH) Security
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege
- Single sign-on from HP BladeSystem Onboard Administrator

Standard Features

Availability

- Dual Port Fibre Channel Mezzanine Card (optional) for redundant SAN connection
- Two hot-plug SAS/SATA hard drive bays and integrated RAID (Smart Array E200i) controller on every server blade (Battery-backed write cache is optional)
- Redundant ROM on every server blade
  Advanced ECC Memory support on every server blade - Advanced ECC can actually correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Redundant fan design on every server blade - The HP BL45p G2 server features ten (10) integrated fans for sufficient cooling. A single fan on each side of the server can fail without interrupting server operations indefinitely
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Security

- Power-on password
- Administrator's password One (1) internal USB 2.0 connector for security key devices and USB drive keys
- Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption
- Integrated Lights-Out 2 can be disabled via a Global Setting

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1000, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Standard Features

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html
NOTE: Server Blade Limited Warranty includes 3 year Parts, 1 year Labor, 1-year on-site support. This warranty supports the HP ProLiant 35p Server Blades.
NOTE: Server Blade Enclosure Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.
NOTE: Server Blade Interconnect Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.
NOTE: The p-Class SAN switch limited warranty is unique to the SAN switch which includes 1 year warranty that is upgradeable to 3 years via Care Pack

HP services provide total care and support expertise with committed response designed to meet your IT and business needs.

The HP Care Pack services ProLiant BL p-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

HP Care Pack services for HP BladeSystem p-Class server blade enclosure covers the enclosure including patch panels, HP supported Ethernet interconnects, power enclosure with power supplies and power distribution.

To fully capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vendor support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- Support Service - 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- Deployment Service - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- Support Service - HP Proactive BladeSystem Service, 1-Year
- Deployment Service - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://www.hp.com/go/proliant/carepack

Dual-Core Models

HP ProLiant BL45p G2 2220, 2GB (2P) 438216-B21	Processor(s)	(2) AMD Opteron™ processor Model 8220 (2.8 GHz, 95W)) (2) AMD Opteron processors Model 8218 (2.6 GHz, 95W) (2) AMD Opteron processors Model 8216 (2.4 GHz, 95W) (2) AMD Opteron processors Model 8214 (2.2 GHz, 95W)
HP BL45P G2 8218 4GB (2P) 408669-B21	Cache Memory	1MB Level 2 cache memory per core
	Memory	4 GB (4 x 1 GB) PC2-5300, Registered DDR2-667
	Network Adapter	Two (2) embedded NC373i Multifunction Gigabit Network Adapters One (1) embedded NC324i Dual Port Gigabit Network Adapter Plus one (1) additional 10/100 NIC dedicated to iLO 2 management
HP BL45P G2 8216 4GB (2P) 408668-B21	Storage Controller	Smart Array E200i Controller with 64MB (optional 128MB battery-backed write cache module available)
HP BL45P G2 8214 4GB (2P) 408667-B21	Hard Drives	(2) SFF SAS/SATA drive bays; no hard drives ship standard
	Internal Storage	Up to 292GB SFF SAS (with optional hot-plug hard disk drives) Up to 240GB SFF SATA (with optional hot-plug hard disk drives)
	Optical Drive	None
	Form Factor	Up to 4 HP BL45p G2 server blades plug vertically an HP BladeSystem p-Class server blade enclosure

NOTE: HP BladeSystem p-Class server blade enclosures with enhanced backplane components might be required depending on which HP ProLiant server blade model is selected. Please visit the enclosure compatibility matrix at http://www.hp.com/go/bladesystem/enclosure/compatibility.

NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Chassis.
NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.
NOTE: FIO indicates that this option only available as a Factory Installable Option.
NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Step 1: Base Server Blade Configuration

Models	HP ProLiant BL45p G2 CTO Blade	404840-B21
	Configurable Model ships with:	
	Four embedded Gigabit Ethernet NIC ports:	
	• Two (2) embedded NC373i Multifunction Gigabit Network Adapters • One (1) embedded NC324i Dual Port Gigabit Network Adapter	
	Plus (1) additional 10/100 NIC dedicated to iLO 2 management.	
	Integrated Smart Array E200i controller NOTE: Controller cache module selection is required. Select either the standard 64 MB module or the optional 128 MB module in step 2 below.	
	Two small form factor (SFF) SAS/SATA hot-plug hard drive bays	
	Integrated Lights-Out 2 Standard Blade Edition	

Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

Processors	**For dual (2) processor configurations choose** (ONE of the following):	
	AMD Opteron™ processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base	438218-L21
	AMD Opteron processor Model 8218 (2.6GHz, 95W) Option Kit, FIO Base	409390-L21
	AMD Opteron processor Model 8216 (2.4GHz, 95W) Option Kit, FIO Base	409391-L21
	AMD Opteron processor Model 8214 (2.2GHz, 95W) Option Kit, FIO Base	409392-L21
	AMD Opteron processor Model 8212 (2.0GHz, 95W) Option Kit, FIO Base	415666-L21
	OR	
	For quad (4) processor configurations choose (ONE of the following):	
	AMD Opteron processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base	438218-L21
	AMD Opteron processor Model 8218 (2.6GHz, 95W) Option Kit, FIO Base	409390-L21
	AMD Opteron processor Model 8216 (2.4GHz, 95W) Option Kit, FIO Base	409391-L21
	AMD Opteron processor Model 8214 (2.2GHz, 95W) Option Kit, FIO Base	409392-L21
	AMD Opteron processor Model 8212 (2.0GHz, 95W) Option Kit, FIO Base	415666-L21
	Plus (ONE of the following):	
	AMD Opteron processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base	438218-B21
	AMD Opteron processor Model 8218 (2.6 GHz, 95W) Option Kit, FIO Base	409390-B21
	AMD Opteron processor Model 8216 (2.4GHz, 95W) Option Kit, FIO Base	409391-B21
	AMD Opteron processor Model 8214 (2.2GHz, 95W) Option Kit, FIO Base	409392-B21
	AMD Opteron processor Model 8212 (2.0GHz, 95W) Option Kit, FIO Base	415666-B21
	NOTE: HP ProLiant BL45p G2 processor option kits (-B21 and -L21) contain two processors.	
	NOTE: The HP ProLiant BL45p G2 only supports 2 and 4 processor configurations.	

Configuration Information - Factory Integrated Models (North America only)

Memory	HP 1GB REG PC2-5300 2x512MB 1RANK Kit	408850-B21
	HP 2GB REG PC2-5300 2x1GB 1RANK Kit	408851-B21
	HP 4GB REG PC2-5300 2x2GB 2RANK Kit	408853-B21
	HP 8GB REG PC2-5300 2x4GB 2RANK Kit	408854-B21
	NOTE: Must be installed in pairs. For additional memory configuration guidelines, see "Memory" section of this HP BL45p G2 QuickSpecs.	
Controller Cache	64 MB Cache – FIO Only	405102-B21
	128MB Battery-Backed Write Cache with Battery Housing NOTE: Supports the Smart Array E200i Controller.	346914-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below. For server blade enclosures, interconnect options, and power subsystem options; please see the following QuickSpecs:

HP BladeSystem p-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12330_na/12330_na.html

and HP BladeSystem p-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12331_na/12331_na.html

And/or refer to the "Options" section below.

Options

Communications	NOTE: Up to two optional NIC mezzanine adapters are available. Choose up to 2 of the following:	
	HP NC320m PCI Express Dual Port Gigabit server adapter for HP BladeSystem	405095-B21
	HP NC374m PCI Express Dual Port Multifunction Gigabit server adapter for HP BladeSystem	405094-B21
	NOTE: There are four mezzanine adapter card connectors on the HP BL45p G2 motherboards. There are two dedicated networking connectors which support two (2) optional Ethernet NIC mezzanine adapter cards, either the HP NC320m PCI Express Dual Port Gigabit server adapter or the HP NC374m PCI Express Dual Port Multifunction Gigabit server adapter. The other two (2) connectors are dedicated for optional, fibre channel mezzanine card adapters.	
Fibre Channel	NOTE: Up to two optional FC mezzanine adapters are available. Choose up to 2 of the following:	
	HP QLogic-based Fibre Channel Mezzanine HBA for HP p-Class BladeSystem NOTE: Includes two small form factor pluggable transceivers with LC connectors for installation into the Patch Panel 2, CGESM or GbE2 Interconnect Switch (with the Storage Connectivity Kit.)	361426-B21
	OR	
	HP Emulex-based Fibre Channel Mezzanine HBA for HP p-Class BladeSystem NOTE: SFPs for use with pass through SAN switches not included with the Emulex-based Fibre Channel Adapter. If SFPs are required, please order the SFP option kit (P/N 397577-B21) which includes 2-2Gb SFPs per option kit.	394757-B21
	HP 2-2Gb SFP for Fibre Channel pass through kit NOTE: Must select if SFP for use with pass through SAN switches is required when ordering Emulex based Fibre Channel Mezzanine card for HP p-Class BladeSystem (P/N 394757-B21).	397577-B21
ProLiant Essentials Value Pack Software	ProLiant Essentials Rapid Deployment Pack	
	ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: This license allows 1 server to be deployed and managed via RDP.	452151-B21
	ProLiant Essentials BL p-Class Server Blade Enclosure with Enhanced Backplane Components and RDP Software Option Kit - 8 server NOTE: This license allows 8 servers to be deployed and managed. Only available with the purchase of ProLiant BL p-Class server blade enclosure (Blade Enclosure QS only)	281404-B22
	NOTE: For additional ProLiant Essentials Rapid Deployment Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.html	
	ProLiant Essentials Server Migration Pack	
	ProLiant Essentials Server Migration Pack, Single-Migration License NOTE: Contains one license, enabling 1 server migration, with a unique license activation key and documentation. NOTE: This license allows 1 server to be migrated from a physical server to a virtual machine. Or this license can be used to migrate a virtual machine from one virtualization layer i.e. VMware GSX to a different virtualization layer such as VMware ESX or Microsoft Virtual Server 2005.	435663-B21

Options

	NOTE: For additional ProLiant Server Migration Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.html	
	Server Migration Pack - Physical to ProLiant Edition	
	ProLiant Essentials Server Migration Pack - P2P Edition, 1- Migration License, - License Only, No Media NOTE: This license allows 1 migration. Contains one license with a unique license activation key and documentation NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12467_na/12467_na.html	417435-B21
	ProLiant Essentials Virtual Machine Management Pack	
	ProLiant Essentials Virtual Machine Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	452153-B21
	NOTE: For additional ProLiant Virtual Machine Management Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.html NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials.	
HP Insight Control Linux Edition for HP BladeSystem	HP Insight Control Linux Edition 1.6 -No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows one (1) server blade to be deployed and managed via HP Insight Control Linux Edition.	452155-B21
	HP Insight Control Linux Edition 1.6,No Media, 8-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows eight (8) server blades to be deployed and managed via HP Insight Control Linux Edition.	452156-B21
	HP Insight Control Linux Edition 1.6, No Media, Flexible-Quantity License, including 1 year of 24x7 Technical Support and Updates NOTE: For use with multiple servers (minimum of 5). This part number allows you to specify the license quantity. When ordering this part number, the quantity ordered will be the number of licenses embedded in a single activation key. A single kit containing that key is then delivered to you.	452157-B21

Options

Remote Management	**Insight Control Environment for BladeSystem**	
	HP Insight Control Environment for BladeSystem, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates	453484-B21
	NOTE: Contains 1 license for each of RDP, PMP, VPM, IPM and iLO Select. Includes one year of 24 x 7 HP Software Technical Support and Update Service	
	HP Insight Control Management Software Media Kit	436222-B21
	NOTE: Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates.	
	NOTE: For additional HP Insight Control Environment, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html	
	Integrated Lights-Out Select Pack	
	ProLiant Essentials Integrated Lights-Out Select Pack, No Media, 1-Server License	452158-B21
	Featuring: sophisticated remote control and security features for HP BladeSystem servers and ProLiant ML/DL servers.	
	NOTE: For additional ProLiant Essentials Integrated Lights-Out Value Packs please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html	
Processors	AMD Opteron™ processor Model 8220 (2.8 GHz, 95W) Option Kit, FIO Base	438218-B21
	AMD Opteron processor Model 8218 (2.6 GHz, 95W) Option Kit	409390-B21
	AMD Opteron processor Model 8216 (2.4GHz, 95W) Option Kit	409391-B21
	AMD Opteron processor Model 8214 (2.2GHz, 95W) Option Kit	409392-B21
	AMD Opteron processor Model 8212 (2.0GHz, 95W) Option Kit	415666-B21
	NOTE: AMD Opteron 8000 Series processors are 64-bit, dual-core, and support AMD Virtualization™ and DDR2 memory technology. AMD Opteron 8000 Series processors are connected through 1 GHz HyperTransport™ links.	
	NOTE: HP ProLiant BL45p G2 processor option kits (-B21) contain two processors.	
	NOTE: The HP ProLiant BL45p G2 only supports 2 and 4 processor configurations.	
Memory (SDRAM DIMMs)	HP 1GB REG PC2-5300 2x512MB 1RANK Kit	408850-B21
	HP 2GB REG PC2-5300 2x1GB 1RANK Kit	408851-B21
	HP 4GB REG PC2-5300 2x2GB 2RANK Kit	408853-B21
	HP 8GB REG PC2-5300 2x4GB 2RANK Kit	408854-B21
	NOTE: Must be installed in pairs. For additional memory configuration guidelines, see "Memory" section of this HP BL45p G2 QuickSpecs.	

Options

Hard Drives	Serial Attached SCSI (SAS) SFF Hot-plug	
	HP 72GB 3G SAS 15k SFF DP HDD	418371-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 36GB 3G SAS 15K SFF DP HDD	418369-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 146GB 3G SAS 10K SFF HDD	431958-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36GB 3G SAS 10K SFF SP HDD	375859-B21
	NOTE: SAS drives have a 3 year warranty. NOTE: Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
	Serial-ATA (SATA) SFF Hot-plug	
	HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21
	HP 60GB 1.5G SATA 5.4K SFF HDD	379306-B21
	NOTE: SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.html	
Controller Cache	128 MB Battery-Backed Cache Enabler	346914-B21
	NOTE: Supports the Smart Array E200i Controller.	
HP BladeSystem p-Class Other Options	HP BladeSystem p-Class Diagnostic Station	230743-B21
	NOTE: The Diagnostic Station allows access to the HP ProLiant p-Class server blades and the BL p-Class interconnect switch outside of the server blade enclosure. The option provides power and a data interface so that "offline" upgrade and diagnostic functions may be performed.	
HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	NOTE: Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.html	
HP StorageWorks Modular Smart Array 1500 cs	Modular Smart Array 1500 Controller Shelf	AA986A
	NOTE: Please see the StorageWorks Modular SAN Array 1500 cs QuickSpecs for additional options and configuration information at: http://www.hp.com/go/MSA1500cs	

Options

Cluster Options	ProLiant Cluster Starter Kit	364023-B22
	NOTE: For additional information regarding the ProLiant Cluster Starter Kit please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html	
	HP HA/F200 for Entry SAN Cluster	364026-B22
	NOTE: For additional information regarding the ProLiant Cluster for Entry Level SAN please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11932_na/11932_na.html	
	ProLiant Cluster HA/F500 for the Enterprise SAN	364024-B21
	NOTE: For additional information regarding the ProLiant Cluster HA/F500 for Enterprise SAN please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11933_na/11933_na.html	
	NOTE: For configuration/certification options for the HP Parallel Database Cluster for Oracle RAC please go to: http://www.hp.com/solutions/highavailability/oracle	
	HP Serviceguard for Linux ProLiant Cluster, A.11.18 (2 license version - Red Hat EL 4&5, SUSE SLES10)	305199-B27
	HP Serviceguard for Linux, A.11.18 (single license version - Red Hat EL 4&5, SUSE SLES10)	307754-B27
	HP Serviceguard for Linux and Red Hat Global File System - 1 year subscription	T2798AA#001
	HP Serviceguard for Linux and Red Hat Global File System - 3 years subscription	T2798AA#003
	NOTE: For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	
USB Options	USB 2-Button Optical Mouse (Carbonite)	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	USB 2.0 4-port HUB	DG954A
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	External USB 2.0 Multi-Bay II Cradle	PA509A
	Multibay II 9.5mm DVD Drive	PA849A
HP Rack 5000 Series (Metallic Carbonite)	HP5642 Rack-Unassembled	358254-B21
	NOTE: Please see the HP Rack 5642 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12074_na/12074_na.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower	

Options

HP Rack 10000 G2 Series (Graphite Metallic)	10842 G2 (42U) 800mm Wide Rack Cabinet - Pallet	AF041A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Shock Pallet	AF042A
	10647 G2 (47U) Rack Cabinet - Pallet	AF031A
	10642 G2 (42U) Rack Cabinet - Pallet	AF001A
	10642 G2 (42U) Rack Cabinet - Shock Pallet	AF002A
	10642 G2 (42U) Rack Cabinet - Crated	AF003A
	10642 G2 (42U) Rack Cabinet, with Extension - Shock Pallet*	AF004A
	10636 G2 (36U) Rack Cabinet - Pallet	AF011A
	10636 G2 (36U) Rack Cabinet - Shock Pallet	AF012A
	10636 G2 (36U) Rack Cabinet - Crate	AF013A
	10636 G2 (36U) Rack Cabinet, with Extension - Shock Pallet*	AF014A
	10622 G2 (22U) Rack Cabinet - Pallet	AF021A
	10622 G2 (22U) Rack Cabinet - Shock Pallet	AF022A
	NOTE: Please see the Rack 10000 G2 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.html	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower	
HP Rack 10000 Series (Graphite Metallic)	HP S10614 (14U) Rack Cabinet – Shock Pallet	292302-B22
	HP 10647 (47U) Rack Cabinet – Shock Pallet	245160-B23
	HP Rack 10622 (22U) Cabinet – Crated	245163-B23
	NOTE: xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels). xxxxxx-B23 (crated) used for air shipments of empty racks.	
	NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
	NOTE: Please see the Rack 10000 QuickSpecs for additional part number and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.html	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
Monitors and Keyboards	TFT7210R Rack Mounted 17" Monitor	348373-B21
	TFT7600 Rack Mounted 17" Monitor	AG052A
	1U Rackmount Keyboard with USB	AG072A
	NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.	

Options

HP KVM Switch Options	HP BladeSystem p-class KVM Interface Adapter,1 pack	AF100A
	HP KVM CAT5 0x1x8 Server Console	336044-B21
	HP KVM CAT5 0x2x16 Server Console Switch	336045-B21
	PS/2 Interface Adapter, 1-pack	262588-B21
	PS/2 Interface Adapter, 8-pack	262587-B21
	USB Interface Adapter, 1-pack	336047-B21
	Serial Interface Adapter, 1-pack with power supply	373045-B21
	NOTE: Cat5e cables are required to connect Interface Adapters to Consoles Switches. Cat52 cables can be found at the following URL: http://www.hp.com/go/kvm	
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm	
HP Serial Console Server Options	HP 16 Port Serial Console Server	AF101A
	HP 48 Port Serial Console Server	AF102A
	Serial Adapter, RJ45-DB9 DCE Female, 1 Pack	AF103A
	Serial Adapter, RJ45-DB9 DCE Female, 8 Pack	AF110A
	NOTE: Cat5e cables are required to connect Serial Adapters to Serial Console Servers. Additional Serial Adapters and Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	2x1x16 IP Console Switch with Virtual Media	AF601A
	4x1x16 IP Console Switch with Virtual Media	AF602A
	2x16 Server Console Switch with Virtual Media	AF600A
	PS/2 Virtual Media Interface Adapter, 1 pack	AF604A
	NOTE: Requires PS/2 and one USB port on server.	
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
Service and Support Offerings (HP Care Pack Services)	NOTE: The HP Care Pack service part numbers below for HP BladeSystem p-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UD187E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UD188E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UD189E
	NOTE: The HP Care Pack service part numbers below for HP BladeSystem p-Class server blade enclosure covers the enclosure including patch panels, HP supported Ethernet interconnects, power enclosure with power supplies and power distribution.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	HC031E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	HC032E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	HC033E

Options

NOTE: The HP Care Pack service part numbers below covers the HP BladeSystem Brocade and McData SAN Switches.

Hardware Services On-site Service

Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	UC007E
Hardware Installation, Electronic	U5988E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, (24 port) Electronic	UE438E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UC008E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UC009E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UC023E

Installation & Start-up Services

HP Installation & Startup Service for HP BladeSystem Infrastructure NOTE: provides for an integrated hardware and software implementation that includes remote service planning, onsite deployment of hardware and software, installation verification testing and customer orientation. Hardware deployment covers the installation of a single BladeSystem enclosure that include server blades (up to 16), Ethernet network interconnect, and power options. Software deployment covers the installation and configuration of HP Systems Insight Manager (SIM), HP Rapid Deployment Pack (RDP), and deploy up to two operating system editions of either Windows or Linux, using scripted operating system installation software.	UC905E
Installation and Start Up Service for HP BladeSystem	UE604E
ProLiant BL p-Class Blade Server Hardware Installation, Electronic	UA219E
HP BladeSystem p-Class Enclosure and Server Blade Hardware Installation, Electronic	U4971E
Installation and Start-up of Rapid Deployment Pack, Electronic NOTE: Provides for the installation on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days.	U5683E
Provides for the Installation and Start-up of Rapid Deployment Pack Implementation of Rapid Deployment Pack (Basic) (Electronic)	UA042E
HP ProLiant Essentials Vulnerability and Patch Management Pack Installation and Startup Service. (Electronic) NOTE: Service coverage: onsite installation of the Vulnerability and Patch Management (VPM) software on a customer designated server, configuration of the VPM software to acquire security patches, enabling the VPM software to scan up to five (5) systems, applying the security patches to the designated servers, generating a report from VPM that shows the vulnerability assessment results, and providing customer with an orientation to the software.	UC929E
Provides for the Installation and Start-up of System Insight Manager (Electronic)	UA041E
Provides for the Installation and Start-up of System Insight Manager (Electronic)	UA040E

NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/carepack/services/

Software Operating Environment Care Packs

Microsoft Software Operating Environment Software Telephone 9x5 - 3 incident (Electronic)	U8169E
Red Hat Software Operating Environment Software Telephone 9x5 - 10 incident (Electronic)	U3402E

Options

SUSE Software Operating Environment Software Telephone 9x5 - 3 incident (Electronic)	U9615E
ProLiant Essentials Operating Environment, - 5 Day, 8x5,1 year, 3 incident (Electronic)	U8222E

Software Operating Environment Care Packs

NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/carepack/services/

HP Proactive BladeSystem Service Care Pack

1 Year, HP Proactive BladeSystem Service UG858E	UG858E

NOTE: For more information, customer/resellers can contact http://www.hp.com/services/proactivebladeservice

Memory

DIMM Installation Rules:

1. All DIMMs must be PC2-5300 Registered DDR2 DIMMs (667 MHz.)
2. Both DIMM slots in a memory bank must be populated.
3. Both DIMMs in a memory bank must be identical.
4. Processor 1 memory bank A must always be populated.
5. DIMM banks are active only when the corresponding processor socket is populated.
6. If installing only one bank on a processor, populate the bank physically farthest from the processor.
7. If mixing DIMM sizes on the same processor, the largest capacity DIMMs must be populated in the bank physically farthest from the processor. The smallest capacity DIMMs must be populated in the bank physically nearest the processor.
8. For optimal performance in most applications, populate the first memory bank for every populated processor socket.

HP ProLiant BL45p G2 Server Blade (2P Model)

Standard Memory

4096-MB (4 x 1024 MB) of PC2-5300, Registered DDR2-667 DIMMs.

Standard Memory Plus Optional Memory

Up to 53,248-MB of PC2-5300, Registered DDR2-667 DIMM memory is available with the installation of optional PC2-5300, Registered DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

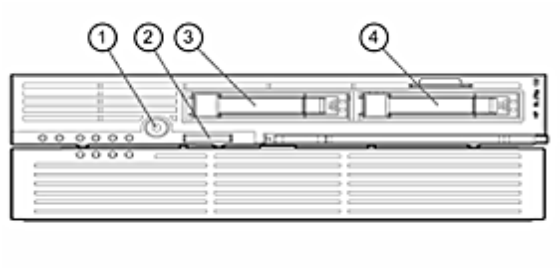
Up to 65,536-MB of PC2-5300, Registered DDR2-667 DIMM memory is available with the removal of standard memory and the installation of optional PC2-5300, Registered DDR2-667 DIMM memory expansion kits.

Memory		Slot							
Standard	4096 MB	1	2	3	4	5	6	7	8
		1024 MB	1024 MB	Empty	Empty	1024 MB	1024 MB	Empty	Empty
		9	10	11	12	13	14	15	16
		Empty	Empty	Empty	Empty	Empty	Empty	Empty	Empty
Optional	53,248 MB	1	2	3	4	5	6	7	8
		4096 MB	4096 MB	1024 MB	1024 MB	4096 MB	4096 MB	1024 MB	1024 MB
		9	10	11	12	13	14	15	16
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB
Maximum	65,536 MB	1	2	3	4	5	6	7	8
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB
		9	10	11	12	13	14	15	16
		4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB	4096 MB

Following are memory options available from HP:

HP 1GB REG PC2-5300 2x512MB 1RANK Kit	408850-B21
HP 2GB REG PC2-5300 2x1GB 1RANK Kit	408851-B21
HP 4GB REG PC2-5300 2x2GB 2RANK Kit	408853-B21
HP 8GB REG PC2-5300 2x4GB 2RANK Kit	408854-B21

Storage



1	Power On/Standby button
2	Local I/O cable connector*
3-4	Two (2) SFF SAS or SATA Hot-plug Hard Drives

NOTE: *The local I/O connector is used with the local I/O cable to perform server blade configuration and diagnostic procedures.

Drive Support

SFF SAS Hard Drives Hot-plug

	Quantity Supported	Position Supported	Controller
72GB 15K SP SAS 36 GB 15K SP SAS 146 GB 10 SAS 72GB 10K SAS 36 GB 10K SAS	2	3-4	Integrated Smart Array E200i Controller

SFF SATA Hard Drives Hot-plug

	Quantity Supported	Position Supported	Controller
120 GB 5.4K SATA 60 GB 5.4K SATA	2	3-4	Integrated Smart Array E200i Controller

Power Specifications

To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator

System Unit	Dimensions (HxWxD)	3.425 x 10.29 x 28.00 in (8.699 x 26.14 x 71.1 cm)	
	Weight (maximum)	31.40 lb (14.24 kg)	
	Temperature Range*	Operating	50° to 95°F (10° to 35°C)
		Shipping	-40° to 140°F (-40° to 60°C)
		Storage	-4° to 140°F (-20° to 60°C)
		Maximum Wet Bulb Temperature	86°F (30°C)
	Relative Humidity (non-condensing)**	Operating	10% to 90%
		Shipping	10% to 90%
		Storage	10% to 95%

*NOTE: All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

**NOTE: Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Smart Array E200i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x2 3G SAS provides 600MB/s maximum bandwidth.
	Cache Memory	40-bit 64MB or 128MB cache: ECC protection, battery-backed, and transportable
	Logical Volumes Supported	Up to 32 logical volumes
	Maximum Logical Drive Capacity	292GB (2 x 146GB)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware

Two (2) Embedded NC373i Multifunction Gigabit Network Adapters	Network Interface	Blackplane connection
	Data Transfer Method	PCI-Express, four lanes (x4)
	Network Transfer Rate	1000Mbps

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.